Preliminary Notice of an Investigation on "Petrocene," a product of the Destructive Distillation of Petroleum. By Samuel P. Sadtler and H. G. McCarter.

(*Read before the American Philosophical Society, February 7th,* 1879.)

In the number of *Comptes Rendus* for 16th December last (tome 87, p. 991), which has just come to my notice, appears an article by MM. L. Prunier and R. David, entitled, "sur la nature de certains produits cristallisés, obtenus accessoirement dans le traitement industriel des pétroles de Pennsylvanie."

In this article the authors announce that they have begun an investigation of "Petrocene," a solid residue from petroleum, which they obtained from Dr. H. Tweddle, of Pittsburg, Pennsylvania. They give some general statements as to the several hydrocarbons, the presence of which they consider to have been indicated by the determinations they made of fusing points, boiling points, solubilities, together with crystallizations gotten with picric acid, and with binitroanthracene. Judging in this way, they state that anthracene, phenanthrene, chrysene, chrysogen and other hydrocarbons are present. They give no specific figures of analyses, but say merely that the percentage of carbon varied in their different analyses from 88 to 96 per cent. in 100. After propounding some interesting theories, based upon these indications, they close by promising to communicate the results obtained from a farther study of the subject, if, as they hoped, these should be new.

This same material has been the subject of our investigation for several months past, and we have obtained results which, while not as yet complete, are so far advanced as to be beyond the point of Messrs. Prunier and David's work, as it is stated in their article. We would therefore claim equal right to the field as scientific workers, and shall continue our studies, and hope to push them to an early completion.

The material we have operated on consists of a full set of Dr. Tweddle's preparations, as described by him in the Franklin Institute Journal Vol. 72, p. 204, which was given to one of us some two years ago, by Dr. F. A. Genth, and a bottle of the crude distillate before treatment with petroleum benzine, given to us by Dr. G. F. Barker.

Some weeks of study had indeed been given to these products in the summer of 1877, by one of us in conjunction with Dr. E. F. Smith, of the University of Pennsylvania, which work was interrupted and only resumed, as stated, a few months ago.

The following is a brief and general statement of the ground covered by our work. The conclusions are all subject to revision as the examination of purer products may demand.

We found that the method of breaking up the compound by treatment with solvents did not suffice to give us pure products of constant compositions. We therefore availed ourselves of the method of forming double crystallizations with picric acid from solution in alcohol and benzol. We

obtained what appeared to be three distinct crystallizations here—two of deep red crystals and one of brown plates. These were picked apart as they crystallized together, using a hand lens, and exercising great care, and were then submitted to recrystallizations until quite pure and distinct. On breaking up these picric acid compounds with dilute ammonia, we obtained at least two well-marked and distinctly different hydrocarbons. With regard to the hydrocarbon from the third set of crystals we are still in doubt.

Of the two hydrocarbons, one fuses constant at 280°C., and the other at 178°C. We are not able to identify them certainly with any of the known hydrocarbons.

Of both of these hydrocarbons, quinones have been made, and of one of them the alizarine, acting upon the quinone with strong sulphuric acid with heat, and then fusing the dried residue with solid potassium hydrate. The quinone dissolves in sulphuric acid with a dark purple color, and when the nearly black residue of di-sulphoquinonic acid and potassium hydrate are fused together, a dark yellowish-brown color is obtained. From the solution of this, hydrochloric acid precipitates the alizarine as a dark brown flocculent mass.

Several analyses of the quinone and of the alizarine were made. As I hold the whole subject still open to revision, I will not quote them, but merely say that both the quinone and the alizarine derived from the hydrocarbon, fusing at 280°C., indicate a probable composition C_{16} H_{14}. This would be a dimethyl-anthracene, yet the hydrocarbon does not agree with the dimethyl-anthracene discovered by Van Dorp, and studied by Wachendorf and Zincke.

With this brief mention of the work done, we will defer any further discussion until our results are sufficiently advanced to be presented as a whole. We are now engaged upon the work, and will push it promptly to a completion.

Character of some Sullivan County Coals. By Franklin Platt.

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It has already been noted in giving the detailed description of the coal openings in Sullivan county, that the different coals mined presented wide differences in character, and in one or two instances offered some most unusual features.*

These characteristics may be briefly summed thus :†

* See unpublished Report of Progress, Second Geological Survey of Pennsylvania, GG.

† See the analyses made by Mr. A. S. McCreath, Chemist of the Survey at Harrisburg, given below.